

CLAIMS

What is claimed is:

1. An optical recording medium comprising:
a user data area and a lead-out area, wherein the user data area and the lead-out area each has grooves and lands formed thereon, wobbles are formed on at least one lateral surface of each of the grooves, and the wobbles of the lead-out area have different characteristics from those of the user data area.
2. The optical recording medium according to claim 1, wherein the wobbles of the lead-out area are formed by modulating at least one feature of frequency, period, amplitude and phase of the wobbles of the user data area.
3. The optical recording medium according to claim 2, wherein the wobbles of the lead-out area include addressing information or reference time information in a form of phase locked loop (PLL).
4. The optical recording medium according to claim 2, wherein synchronization patterns of signals read from the grooves of the user data area and the lead-out area are different.
5. The optical recording medium according to claim 2, wherein predetermined recording patterns are recorded on the lead-out area to prevent an optical pickup from deviating from the user data area during recording and/or reproduction of data.
6. The optical recording medium according to claim 2, comprising two or more recording layers for multi-layer recording, each recording layer comprising the user data area and the lead-out area, wherein the user data area and the lead-out area each has grooves and lands formed thereon, the wobbles are formed on at least one lateral surface of each groove, and the wobbles of the lead-out area have different characteristics from those of the user data area.
7. The optical recording medium according to claim 6, wherein the two or more recording layers have different recording patterns in their lead-out areas.
8. The optical recording medium according to claim 7, wherein the lead-out area has a width of two or more times a maximum allowance of disc eccentricity.

9. The optical recording medium according to claim 2, wherein recording is performed on the grooves and/or the lands.

10. The optical recording medium according to claim 1, wherein synchronization patterns of signals read from the grooves of the user data area and the lead-out area are different.

11. The optical recording medium according to claim 1, wherein predetermined recording patterns are recorded on the lead-out area to prevent an optical pickup from deviating from the user data area during recording and/or reproduction of data.

12. The optical recording medium according to claim 1, comprising two or more recording layers for multi-layer recording, each recording layer comprising the user data area and the lead-out area, wherein the user data area and the lead-out area each has grooves and lands formed thereon, the wobbles are formed on at least one lateral surface of each groove, and the wobbles of the lead-out area have different characteristics from those of the user data area.

13. An optical recording medium comprising:
a user data area, and a lead-out area at an outermost circumference, wherein predetermined recording patterns are recorded on the lead-out area to prevent an optical pickup from deviating from the user data area during recording and/or reproduction of data.

14. The optical recording medium according to claim 13, wherein the predetermined recording patterns are formed by repeatedly recording the recording patterns used in the user data area.

15. The optical recording medium according to claim 14, comprising two or more recording layers for multi-layer recording, each recording layer comprising the user data area and the lead-out area, wherein the user data area and the lead-out area each has grooves and lands formed thereon, the wobbles are formed on at least one lateral surface of each groove, and the wobbles of the lead-out area have different characteristics from those of the user data area.

16. The optical recording medium according to claim 15, wherein the two or more recording layers have different recording patterns from one another.

17. The optical recording medium according to claim 16, wherein the lead-out area has a width of two or more times a maximum allowance of disc eccentricity.

18. The optical recording medium according to claim 17, wherein synchronization patterns of signals read from the user data area and the lead-out area are different.

19. The optical recording medium according to claim 17, wherein the two or more recording layers have different synchronization patterns in their lead-out areas from one another.

20. The optical recording medium according to claim 13, wherein the recording patterns are different from those used in the user data area.

21. The optical recording medium according to claim 20, comprising two or more recording layers for multi-layer recording, each recording layer comprising the user data area and the lead-out area, wherein the user data area and the lead-out area each has grooves and lands formed thereon, the wobbles are formed on at least one lateral surface of each groove, and the wobbles of the lead-out area have different characteristics from those of the user data area.

22. The optical recording medium according to claim 21, wherein the two or more recording layers have different recording patterns from one another.

23. The optical recording medium according to claim 22, wherein the lead-out area has a width of two or more times a maximum allowance of disc eccentricity.

24. The optical recording medium according to claim 23, wherein synchronization patterns of signals read from the user data area and the lead-out area are different.

25. The optical recording medium according to claim 23, wherein the two or more recording layers have different synchronization patterns in their lead-out areas from one another.

26. The optical recording medium according to claim 20, wherein recording is performed on grooves and/or lands formed on the user data area and the lead-out area.

27. The optical recording medium according to claim 13, wherein recording is performed on grooves and/or lands formed on the user data area and the lead-out area.

28. An optical recording medium having a user data area and a lead-out area, wherein the user data area and the lead-out area each has grooves and lands formed thereon, different types of synchronization patterns are used in the lead-out area and the user data area.

29. An optical recording medium, comprising:
two or more recording layers, each comprising a user data area and a lead-out area;
grooves and lands formed on the user data areas and the lead-out areas; and
wobbles formed on at least one lateral surface of each groove to provide a uniform transmittance of an optical light beam passing through one of the recording layers.

30. The optical recording medium according to claim 29, wherein the wobbles of the user data area of the one recording layer have different characteristics from the wobbles of the lead-out area of the one recording layer.

31. The optical recording medium according to claim 30, wherein the wobbles of the lead-out area of the one recording layer are formed by modulating at least one feature of frequency, period, amplitude and phase of the wobbles of the user data area of the one recording layer.

32. The optical recording medium according to claim 31, wherein the lead-out area of the one recording layer has a width two or more times a maximum allowance of recording medium eccentricity.

33. The optical recording medium according to claim 31, further comprising:
predetermined recording patterns recorded on the lead out areas of the recording layers.

34. The optical recording medium according to claim 31, further comprising:
synchronization patterns on the user data area of the one recording area that differ from synchronization patterns on the lead-out area of the one recording area.

35. The optical recording medium according to claim 31, wherein recording is performed on the grooves and/or the lands of the recording layers.

36. A multi-layer optical recording medium, comprising:
user data areas on each recording layer;
grooves formed on the user data areas;
user data wobbles formed on at least one lateral surface of each groove of one of the recording layers; and
lead out wobbles, which differ from the user data wobbles of the one recording layer, formed in an area beyond a predetermined radius of the one recording layer.

37. The multi-layer optical recording medium according to claim 36, wherein the wobbles of the lead-out area of the one recording layer are formed by modulating at least one feature of frequency, period, amplitude and phase of the wobbles of the user data area of the one recording layer.

38. The multi-layer optical recording medium according to claim 37, wherein recording is performed on the grooves and/or lands formed on the user data area of the one recording layer and the area beyond the predetermined radius of the one recording layer.

39. A method of recording/reproducing on an optical recording medium, comprising:
configuring a user data area and a lead-out area on two or more recording layers;
forming grooves and lands on the user data areas and the lead-out areas; and
forming wobbles on at least one lateral surface of each groove to provide a uniform transmittance of an optical light beam passing through one of the recording layers.